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IS : 980 - 1980

Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO STOVING

(First Revision)

UDC 677·016·473·4 : 535·684·32

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 1981

AMENDMENT NO. 1 JANUARY 1989
TO
IS : 980 - 1980 METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO STOVING

(*First Revision*)

(*Clause* **4.4**, *line* 1) — Substitute 'Fabrics' *for* 'Fibres'.

(*Clause* **4.4**, *line* 3) — Insert '(*see also* Appendix A of IS : 1025 - 1982§)' at the end .

(*Page* 4, *foot-notes*) — Insert the following foot-note:

'§General principles of testing textile for colour fastness tests.'

(*Clause* **5.2**) — Substitute the following for the existing clause:

'**5.2 Soap Solution** — The solution shall contain 5 g of soap per litre. The soap shall conform to the requirement given below, with moisture regain not more than 5 percent. The soap shall be free from optical brightening agents:

Sl No.	*Characteristic*	*Requirement*
i)	Free alkali calculated as Na_2CO_3, *Max*	0·3 percent
ii)	Free alkali calculated as NaOH, *Max*,	0·1 percent
iii)	Combined fatty acids calculated as Na salts, *Min*	85 percent
iv)	Titre of mixed fatty acids prepared from the soap, *Max*	39°C
v)	Iodine value of fatty acids, *Max*	50

(*Page* 5, *foot-note marked with* '*' *mark*) — Delete.

(*Clause* **7.5**, *line* 2) — Substitute 'IS : 768 - 1982*' *for* 'IS : 768 - 1956*'.

(*Clause* **7.5**, *line* 4) — Substitute 'IS : 769 - 1982†' *for* 'IS : 769 - 1956†'.

(*Clause* **7.5**, *Note*) — Substitute 'NOTE 1' for the existing NOTE and insert 'NOTE 2' after 'NOTE 1' as follows:

'NOTE 2 — In cases of doubt in the colour fastness ratings as assessed by an observer, the assessment should be done by at least three observers and the over-all average rating should be reported.'

(*Page* 6, *foot-notes*) — Substitute the following for the existing foot-notes:

'*Method for evaluating change in colour (*first revision*).

†Method for evaluating staining (*first revision*).'

(TDC 5)

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO STOVING

(First Revision)

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(*Continued on page* 2)

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO STOVING

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 September 1980, after the draft finalized by the Chemical Methods of Tests Sectional Committee had been approved by the Textile Division Council.

0.2 This standard published in 1957 has been revised to align it with ISO 105-N 05-1978 (E) Textiles — Colour fastness N 05 colour fastness to stoving, issued by the International Organization for Standardization, on which it is mainly based. As the quality of soap powder prescribed in the standard was not readily available in the market, a reference to IS : 2887-1974* has been made.

0.3 Colour fastness of textile materials is of considerable importance to the consumer. The fastness depends not only upon the nature and depth of shade of the dyestuff used but also upon the nature of the fibre and the method of dyeing or printing employed; the same colouring matter, when used in dyeing or printing different fibres or when applied by different methods upon the same fibres may give vastly different results. Formulation of standard methods of test for determining colour fastness of textile materials to different agencies and processes likely to effect change in colour is, therefore, necessary.

1. SCOPE

1.1 This standard prescribes a method for determination of colour fastness of textile materials to the action of sulphur dioxide which is used for bleaching animal fibres.

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*Specification for laundry soap powders (*first revision*).

2. PRINCIPLE

2.1 A composite specimen of the textile and a composite test-control specimen (in contact with adjacent fabrics) containing its own mass of soap solution, are exposed in an atmosphere containing sulphur dioxide. The change in colour of the specimen and the staining of the adjacent fabrics are assessed with Grey Scales.

3. SAMPLING

3.1 The samples of fibres, yarns or fabrics shall be so drawn as to be representative of the lot. Sample drawn in accordance with the procedure laid down in the material specifications or as agreed to between the buyer and the seller shall be taken as representative of the lot.

Note — Reference to IS : 4952-1968* and IS : 5463-1969† may be made for drawing samples of cotton fibres and fabrics.

4. APPARATUS

4.1 Vessel — of approximately 10-litre capacity for the sulphur dioxide atmosphere.

4.2 Grey Scales — For assessing the change in colour and staining.

4.3 Test Control — A dyeing of wool of 2·5 percent Acid Red 163 (Colour Index 3rd Edition) shall be used to ensure that the test is carried out correctly.

Note — For preparation of dyeing, *see* Appendix A.

4.4 Two Adjacent Fibres — Each measuring 10 × 4 cm, one piece made of wool and the other of the same fibre as the cloth under test or as otherwise specified.

5. REAGENTS

5.1 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in the tests and distilled water (*see* IS : 1070-1977‡) shall be used where the use of water as reagent is intended.

Note — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

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*Methods for sampling of cotton bales, slivers and rovings.

†Methods for sampling of cotton fabrics for chemical tests.

‡Specification for water for general laboratory use (*second revision*).

5.2 Soap Solution — The solution shall contain 5 grams of soap per litre. The soap shall conform to the requirements of Type I of IS : 2887-1974* (*see* Note) with moisture regain not more than 5 percent and titre of fatty acids not more than 25°C. The soap shall be free from optical brightening agents.

NOTE — The essential requirements of soap are reproduced below:

Sl No.	*Characteristic*	*Requirement for Soap Type 1 (Pure)*
i)	Total fatty matter, percent by mass, *Min*	80·0
ii)	Rosin acid, percent by mass of total fatty matter, *Max*	3·0
iii)	Unsaponified fatty matter, percent of mass, *Max*	0·5
iv)	Free caustic alkali, percent by mass, *Max*	0·05
v)	Matter, insoluble in alcohol, percent by mass, *Max*	2·0
vi)	Glycerol, percent by mass, *Max*	1·5
vii)	Hexabromide test (on fatty acids)	Negative

5.3 Sulphur

6. PREPARATION OF TEST SPECIMENS

6.1 If the textile to be tested is fabric, place a specimen of 10 × 4 cm between the two adjacent fabrics (*see* **4.4**) and sew along all four sides to form a composite specimen.

6.2 If the textile to be tested is yarn, knit it into fabric and treat it as in **6.1**, or form a layer of parallel lengths of it between the two pieces of adjacent fabrics (*see* **4.4**), the amount of yarn taken being approximately equal to half of the combined mass of the adjacent fabrics. Sew along all four sides to hold the yarn in place and to form a composite specimen.

6.3 If the textile to be tested is loose fibre, comb and compress an amount approximately equal to half of the combined mass of the adjacent fabrics (*see* **4.4**) into a sheet 10 × 4 cm. Place the sheet between the two adjacent fabrics and sew along all four sides to hold the fibre in place and to form a composite specimen. If necessary, sew along the two diagonals also.

6.4 Prepare at least three composite test specimens.

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*Specification for laundry soap powders (*first revision*).

6.5 Test Control — Prepare the composite specimen of the test control dyeing (*see* **4.3**) as given in **6.1**.

7. PROCEDURE

7.1 Thoroughly impregnate the composite specimen and the composite test control specimen by immersion for 5 minutes at a temperature of 25 ± 2°C in the soap solution, then squeeze so that each contains its own mass of solution (*see* Note).

NOTE — When the material is to be wetted to contain its own weight of liquor, it may be saturated with the liquor and then drawn between two rubber rollers, squeezed by means of a rubber roller on a glass plate, or centrifuged. Wringing by hand does not give uniform wetting.

7.2 Suspend the composite specimen and the composite test-control specimen for 16 hours in the vessel containing an atmosphere of sulphur dioxide obtained by igniting 5 grams of sulphur below the composite specimen and the composite test control specimen and immediately closing the vessel.

7.3 Remove the composite specimen and the composite test control specimen from the sulphur dioxide atmosphere, remove the stitching along three sides of each and allow both to hang in air for at least 2 hours without rinsing. The composite specimen and the composite test control specimen are to be examined when dry. If the composite specimen contains cellulosic fibres, rinse it immediately after removal from the sulphur dioxide atmosphere in distilled water in order to remove the acidity and then in cold running tap water. Remove the stitching along three sides of both specimens and dry them by hanging them in air at a temperature not exceeding 60°C with the three parts in contact only at the remaining row of stitching.

7.4 Assess the effect on the test control specimen with the Grey Scale. If the change in colour is not equal to the contrast illustrated by Grade 3, the test has not been carried out correctly and the operations described in **7.1** to **7.5** should be repeated with a fresh composite specimen and a fresh composite test control specimen.

7.5 Evaluate the change in colour of the treated test specimen by the method prescribed in IS : 768-1956* and the degree of staining of the two pieces of adjacent fabrics by the method prescribed in IS : 769-1956†.

NOTE — Treated test specimens and the two pieces of adjacent fabrics should be allowed to cool after drying and to regain their normal moisture content before evaluation.

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*Methods for evaluating change in colour.

†Method for evaluating staining.

7.6 Repeat the test with the remaining composite specimens.

8. REPORT

8.1 The report shall include the following information:

a) type of material,
b) the numerical ratings for change in colour of the test piece, and
c) the numerical ratings for staining of the two adjacent fabrics.

APPENDIX A

(Note *under* 4.3)

PREPARATION OF DYEING

A-1. Wet out a sufficiently large sized piece of wool cloth and enter it at 40°C into a dyebath containing 2·5 percent Acid Red 163 (Colour Index, 3rd Edition), 10 percent sodium sulphate crystals ($Na_2 SO_4$, 10 H_2O) and 3 percent acetic acid (30 percent), all percentages being calculated on the weight of the piece and using liquor to material ratio of 40 : 1 (ml : g).

A-2. Bring the dyebath to boil in 30 minutes and boil for 30 minutes. Exhaust the dyebath, if necessary, by carefully adding 1 to 3 percent acetic acid (30 percent) or 1 percent sulphuric acid (specific gravity 1·84) well diluted with water. Boil the bath for a further period of 15 minutes after the addition of acid. Remove the piece, rinse it and dry.

(*Continued from page* 2)

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Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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